

# Important Advances in Clinical Medicine

## *Epitomes of Progress — Pathology*

*The Scientific Board of the California Medical Association presents the following inventory of items of progress in pathology. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist the busy practitioner, student, research worker or scholar to stay abreast of these items of progress in pathology which have recently achieved a substantial degree of authoritative acceptance, whether in his own field of special interest or another.*

*The items of progress listed below were selected by the Advisory Panel to the Section on Pathology of the California Medical Association and the summaries were prepared under its direction.*

Reprint requests to: Division of Scientific and Educational Activities,  
California Medical Association, 731 Market St., San Francisco, CA 94103

### **Endomyocardial Biopsy**

BIOPSY OF THE kidney, liver or bone marrow is routinely carried out in clinical medicine. Endomyocardial biopsy now also has become a routine diagnostic procedure in many medical centers. Published techniques for obtaining myocardial biopsy specimens have included percutaneous needle biopsy of the left ventricle, open thoracotomy and catheter needle biopsy of the septum. The associated morbidity and mortality with these methods have precluded their widespread acceptance. The new method, a percutaneous transvenous biopsy of the endomyocardium using a modified catheter forceps, can now be done safely on an outpatient basis. More than 2,000 endomyocardial biopsies have been done at Stanford Medical Center. There have been no deaths, and the morbidity has been less than for renal or liver biopsies. The major complication is cardiac perforation and tamponade. In our series this occurred four times in more than 2,000 procedures; treatment was by pericardiocentesis and uneventful recoveries were made in each case. Other complications include transient atrial arrhythmias and transient nerve palsies relating to

internal jugular vein puncture. The biopsy tissue is sufficient for light, electron microscopic and frozen tissue (immunofluorescence) studies.

For the first time this biopsy method has made possible the earliest detection of a cardiac disease process in living patients and has documented its reversal after treatment. Both left and right ventricular biopsies can be carried out with relative safety. Some of the indications for endomyocardial biopsy may be summarized: diagnosis and follow-up of treatment of myocarditis, diagnosis and treatment of rejection in cardiac transplant recipients, diagnosis of primary and secondary cardiomyopathies, (such as hemochromatosis or sarcoidosis) and differentiation between myocardial and pericardial restrictive cardiomyopathy (such as amyloid disease). More recently endomyocardial biopsy has been used for the diagnosis and monitoring of cardiotoxicity in patients treated with anthracycline for cancer. For this purpose a biopsy grading system is used for the early detection of those patients at risk for heart failure. The treatment can then be managed to prevent cardiomyopathy and ensure a maximum antineoplastic effect rather than depending on an arbitrary dose limitation. The advent of the

endomyocardial biopsy has enormous and exciting potential in both clinical and research applications.

MARGARET E. BILLINGHAM, MD

#### REFERENCES

- Caves P, Coltart J, Billingham M, et al: Transvenous endomyocardial biopsy—Application of a method for diagnosing heart disease. *Postgrad Med J* 51:286-290, May 1975
- Mason JW: Techniques for right and left ventricular endomyocardial biopsy. *Am J Cardiol* 41:887-892, May 1, 1978
- Billingham ME, Mason JW, Bristow MR, et al: Anthracycline cardiomyopathy monitored by morphologic changes. *Cancer Treat Rep* 62:865-872, Jun 1978
- Billingham ME: Some recent advances in cardiac pathology. *Hum Pathol* 10:367-386, Jul 1979

### Fine-Needle Aspiration Biopsy Cytology

CYTOLOGICAL DIAGNOSIS by fine-needle aspiration biopsy is a highly reliable, safe and inexpensive laboratory procedure. The advantages of needle aspiration biopsy include rapid diagnosis and simplicity with minimal discomfort and morbidity. A conclusive diagnosis of malignancy or etiological agent can usually be established without need to carry out open biopsy and frozen section of suspected lesions. For breast or superficial lesions, it is a feasible office procedure easily applied to patients with newly discovered palpable masses. At times, thoracotomy or laparotomy can be avoided. With the help of the image fluoroscopic intensifier in radiology, pulmonary lesions are accessible to the needle. With the guidance of ultrasound, biopsy specimens of deep abdominal or retroperitoneal masses can be taken.

An unequivocal diagnosis of malignancy may help physicians expedite necessary surgical therapy or it may influence therapeutic strategy in advance, making it possible to avoid less than ideal surgical procedures. For example, the cytological diagnosis of undifferentiated small cell carcinoma of the lung may be adequate for treatment by combined radiation and chemotherapy. Patients can be more completely informed before definitive surgical operation if this is desirable. The method has an overall diagnostic accuracy of 84 percent to 92 percent. A negative or a doubtful aspiration due to various reasons (such as faulty technique, poor sample or inexperience) must be followed by a repeat aspiration or an expeditious open diagnostic procedure to prevent a delay in appropriate treatment. False positive diagnoses have been reported to occur in up to 0.9 percent of aspirates.

The technique of aspiration sampling of palpable masses (breast, thyroid, lymph nodes and the like) and sonographically or radiologically

visible lesions from different organs (lungs, pancreas, kidneys and so forth) is done with a 20-ml disposable syringe attached to a 22-gauge needle of appropriate length (1 to 4 inches). The use of an aspiration device (such as a Cameco syringe pistol, imported from Sweden by Precision Dynamics Corporation, Burbank, California) is preferred. The skin is first cleansed. Usually local anesthesia is not necessary. After the needle has penetrated the lesion, the syringe is retracted. Several short, quick lesional penetrations are done through the original puncture. Before the needle is removed, the vacuum in the syringe is equalized by releasing the piston. The needle is then withdrawn. The diagnostic specimen is in the needle, not in the syringe, unless fluid has been aspirated from a hollow organ, or a cystic or necrotic mass. Smears are prepared, fixed in 95 percent alcohol and stained with the method of choice. If clinically indicated, the specimen may also be cultured. Any tissue particle remnants should be fixed in formalin and submitted for a cell block histologic study to facilitate diagnostic accuracy and a possible typing of neoplasia.

RAOUF E. YUJA, MD  
EMMETT B. REILLY, MD

#### REFERENCES

- Frale WJ, Frale MAS: Thin-needle aspiration biopsy: The diagnosis of head and neck tumors revisited. *Cancer* 43:1541-1548, Apr 1979
- Hajdu SI, Melamed MR: The diagnostic value of aspiration smears. *Am J Clin Pathol* 59:350-356, Mar 1973
- Kline TS, Neal HS: Needle aspiration biopsy: A critical appraisal—Eight years and 3267 specimens later. *JAMA* 239:36-39, Jan 2, 1978
- Zajicek J: Aspiration Biopsy Cytology—Part I: Cytology of Supradiaphragmatic Organs. (Monographs in Clinical Cytology Series, Vol. 4, Wied GL, von Haam E, Koss LG, et al (Eds).) Basel, S. Karger, 1974

### Neonatal Sepsis and Infective Endocarditis

ALTHOUGH THE CLINICAL PRESENTATION and antimicrobial therapy of infective endocarditis in infants are similar to those in adults, the events precipitating infection in neonates are often different and continue to change as medical technology advances. Although congenital heart disease is a known factor predisposing to infective endocarditis in infancy, in most reported cases of infective endocarditis in patients younger than 2 years old there is no preexisting heart disease. This prevalence of infective endocarditis in infants with normal hearts is partly related to the increased frequency of sepsis in these infants. With increased use of cardiac catheterization and hyperalimentation in this age group, there is in-